REMARKS

In the Office action dated May 24, 2002, the elected species D was redefined to include Figures 11-15 and 19. Claims 35, 37, 44-47, 54, 56-59, 62-64, 69-71, 75, and 76 were withdrawn from consideration as being drawn to an unelected species. Claims 34, 36, 38, 48, and 53 were rejected under the judicially created doctrine of obviousness-type double patenting. The drawings were objected to as failing to comply with 37 CFR 1.84(p)(5). The specification was objected to for an informality. Claims 34, 38-40, 43, 48, 49, 52, 53, 55, 60, 61 and 65 were rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 5,709,224 ("Behl"). Claims 68, 72-74, 77, and 78 were rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 5,885,278 ("Fleischman"). Claims 36, 50, and 66 were rejected under 35 U.S.C. 103(a) as being unpatentable over Behl in view of Fleischman. Claims 41, 42, 51, 67, and 79-82 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form.

By the present amendment, the specification has been amended to address certain informalities. Claims 34, 36, 38-43, 48-53, 55, 60-61, 65-68, 72-74, and 77-82 are pending and under consideration in the present application. Applicant respectfully requests reconsideration of the present application.

Attached hereto is a marked-up version of the changes made to the specification and the claims by the present amendment. The attached page is captioned "Version With Markings To Show Changes Made."

OBVIOUSNESS-TYPE DOUBLE PATENTING

Claims 34, 36, 38, 48, and 53 were rejected under the judicially created doctrine of obviousness-type double patenting. Should these claims be found to be otherwise allowable over prior art, Applicant will submit a terminal disclaimer to obviate this rejection.

OBJECTIONS TO SPECIFICATION AND DRAWINGS

The specification was also objected to for an informality on page 10, line 20. Applicant has amended the specification to correct an apparent typographical error in an attempt to address the objection.

The drawings were objected to for not including the following reference signs mentioned in the description: "76" as set forth on page 18, lines 12-13; and reference numeral "35" as set forth on page 20, line 31. Applicant has amended the specification to correct apparent typographical errors in an attempt to address the objection.

SECTION 102 AND 103 REJECTIONS

Claims 34, 38-40, 43, 48, 49, 52, 53, 55, 60, 61 and 65 were rejected under Section 102(e) as being anticipated by Behl, and claims 68, 72-74, 77, and 78 were rejected under Section 102(e) as being anticipated by Fleischman. Claims 36, 50 and 66 were rejected under Section 103(a) as being unpatentable over Behl in view of Fleischman.

The Office action asserted that "Behl discloses a catheter (figs 1-4C, and 7) having a working end 16, and at least two electrodes 24 to cause shrinkage of a blood vessel." The Office

action also asserted that Fleischman discloses "at least four exposed, electrically conductive surfaces 20(1), in fig. 9;" and "a plurality of electrically conductive lines . . . electrically connected to the exposed surfaces" in Figures 10 and 11A.

The Office action has identified elements 24 as "electrodes" in Behl. Applicant respectfully submits that the Office action has misconstrued the teachings of Behl. Specifically, at column 7, lines 32-37 (with reference to Figures 1-3), Behl states that "the opposed elements 24" may be "formed from a resilient material such as . . . a superelastic alloy or plastic, or a resilient organic polymer." Applicant respectfully submits that it would be inappropriate to use a "plastic" or "organic polymer" as the conductive material for an "electrode" as asserted in the Office action. Applicant also notes that at column 8, lines 44-48 (with reference to Figure 7), Behl states that "[t]he opposed elements 66 are similar to the opposed elements 24" of Figures 1-3. Applicant respectfully submits that Behl does not disclose or suggest the electrodes "to produce directional RF field" to cause preferential shrinkage as recited in independent claim 34; or the "directional energy application apparatus" as recited in independent claim 53.

With respect to Fleischman, the Office action has not identified the polarity of the various electrode elements 28 of the half-loop structures 20(1) disclosed in that reference. In addition, the teaching in Fleischman of "creating continuous, long and thin, lesion patterns in tissue when ablation energy is applied simultaneously to adjacent emitting electrode elements 28," suggests that each electrode is located adjacent to another electrode of unlike polarity. *See* Fleischman at col. 9, lines 33-37. Applicant also respectfully submits that Fleischman does not disclose or suggest having "each exposed surface [being] located adjacent another exposed surface of like

polarity and adjacent exposed surface of unlike polarity; whereby energy imparted by a pair of exposed surfaces of unlike polarity is directional," as recited in independent claim 68.

Applicant respectfully requests that the Section 102 and 103 rejections be withdrawn. Should the presently rejected claims be found to be allowable over prior art, then the Applicant also respectfully requests that the claims which were withdrawn from consideration as being drawn to an unelected species, be considered and allowed as well.

CONCLUSION

Applicant respectfully requests favorable reconsideration of the claims at an early date. If the Examiner has any comments or questions regarding any of the foregoing, kindly telephone the undersigned.

Respectfully submitted,
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Version With Markings To Show Changes Made

IN THE SPECIFICATION:

Please substitute the paragraph beginning on page 10, line 21, with the following paragraph:

-- When the electrodes 24 and 26 of the catheter 20 are positioned at the treatment site of the incompetent venous section, an RF generator, electrically connected to the electrodes, is activated to provide suitable RF energy, preferably at a selected frequency from a range of 250 kHz to 350 [mHz] MHz. One suitable frequency is 510 kHz. One criterion used in selecting the frequency of the energy to be applied is the control desired over the spread, including the depth, of the thermal effect in the venous tissue. Another criterion is compatibility with filter circuits for eliminating RF noise from thermocouple signals. --

Please substitute the paragraph beginning on page 18, line 3, with the following paragraph:

-- The bowable electrodes 66 are connected to a slidable tube 70 and a fixed tip 72 at the working end 74, where moving the tube 70 controls the diameter of the electrode deployment for proper treatment of vein lumen having different diameters. The inner stop tube 78 is connected to the slidable tube 70 and acts as a stop device as the slidable tube 70 and inner stop tube 78 are slid over the inner shaft 83 by making contact with the stop surface 80 that is fixed in position

with the tip. The inner stop tube 78 thus interacts with the stop surface 80 to limit the amount of deployment of the bowable electrodes 66. A fluid cover 82, shown here in cutaway form as a bellows, prevents fluids from entering the space between the inner shaft 83 and the inner stop tube 78 and is discussed in greater detail below. A guide wire [76] 98 is seen protruding out the working end 74. --

Please substitute the paragraph beginning on page 20, line 20, with the following paragraph:

-- The entire length of the bowable longitudinal electrode is conductive, and insulation 90 may be provided over the majority of the electrode surface in order to prevent any unintended heating effects. Only a modest portion of the conductive surface 68 is exposed to act as the electrode. The exposed surface can be placed closer to the tip 72 so that when the bowable electrodes are moved away from the catheter, the exposed conductive surface of the electrodes will be near the tip 72 which can be positioned adjacent the commissures and leaflets of the vein. The heating effect is greatest when the electrodes are close together since the electrical field density (power density) is greatest at this point. The ends of the electrodes are insulated from each other to prevent creating larger electrical field densities at the ends, especially as the effective diameter increases which would create even greater field disparities between the ends and the bowed midsection where the electrode gap is larger. The insulation [35] 90 can be polyimide, paralyene, or another type of insulating film. Insulation [35] 90 provided along the

inner radius of the bowable electrodes away from the venous tissue further prevents heating the blood flowing in the vein and reduces the likelihood of coagulation. The remaining exposed area 68 of the electrode is preferably the area which contacts the venous tissue during apposition. The heating effect is then focused along that portion of the venous tissue and between the positive and negative electrodes. Where the arm 66 has a rectangular shape, then the exposed area which functionally acts as the electrode would then occupy only one face of that wire. The insulation 90 surrounding the electrode can further cover the peripheral edges of the exposed face of the electrode to further isolate the blood flow from unintended heating effects. --